REMARKS

Claims 1 through 10 are currently pending in the application.

This amendment is in response to two Office Actions of December 14, 2004.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Bernier et al. (U.S. Patent 6,069,023) in combination with MacDonald, Jr. et al. (U.S. Patent 5,905,638)

Claims 1 through 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernier et al. (U.S. Patent 6,069,023) in combination with MacDonald, Jr. et al. (U.S. Patent 5,905,638). Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicant has amended the claimed invention to clearly distinguish over the cited prior art.

Turning to the cited prior art, the Bernier et al. reference teaches or suggests the use of an aluminum or copper heat sink attached to a ceramic cap or exposed semiconductor chip using an adhesive.

The MacDonald, Jr. et al. reference teaches or suggests the use of a silicone gel elastomer.

Applicant asserts that any combination of the Bernier et al. reference and the MacDonald, Jr. et al. reference does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently claimed inventions of presently amended independent claims 1, 4, 6, and

9 because, at the very least, any combination of the cited prior art does not teach or suggest all of the claim limitations of the presently claimed inventions.

Applicant asserts that any combination of the Bernier et al. reference and the MacDonald, Jr. et al. reference does not teach or suggest the claim limitations of presently amended independent claims 1, 4, 6, and 9 calling for "a heat sink cap having a portion thereof contacting a portion of the substrate covering the gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the gel elastomer", "a heat sink cap having a portion thereof in contact with a portion of the substrate and a portion of the gel elastomer, the heat sink cap covering the gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate", "a heat sink cap having a portion contacting a portion of the substrate covering the compliant, adhesive, and filled with a thermally conductive material, gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the gel elastomer", and "a heat sink cap having a portion thereof in contact with a portion of the substrate and a portion of the compliant, adhesive, and filled with a thermally conductive material, gel elastomer, the heat sink cap covering the compliant, adhesive, and filled with a thermally conductive material, gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate". Neither the Bernier et al. reference nor the MacDonald, Jr. et al. reference nor any combination thereof teaches or suggests a heat sink cap having a portion thereof contacting a portion of the substrate. Therefore, presently amended independent claims 1, 4, 6, and 9 are allowable as well as the dependent claims therefrom.

Obviousness Rejection Based on Mertol (U.S. Patent 5,909,056) in combination with Block et al. (U.S. Patent 5,137,959)

Claims 1, 3, 4, 6, 8 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mertol (U.S. Patent 5,909,056) in combination with Block et al. (U.S. Patent 5,137,959). Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in

the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicant has amended the claimed invention to clearly distinguish over the cited prior art.

Turing to the prior art, the Mertol reference teaches or suggests a an integrated heat spreader and ring stiffener coupled with the non-active surface of a semiconductor die by a phase change material which is retained by a miniature dam ring while in a liquid state on a substrate.

The Block et al. reference teaches or suggests the use of a thermally conductive, electrically insulating filler in thermally conductive, electrically insulating elastomers.

Applicant asserts that any combination of the Mertol reference and the Block et al. reference does not teach or suggest the claim limitations of presently amended independent claims 1, 4, 6, and 9 calling for "a heat sink cap having a portion thereof contacting a portion of the substrate covering the gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the gel elastomer", "a heat sink cap having a portion thereof in contact with a portion of the substrate and a portion of the gel elastomer, the heat sink cap covering the gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate", "a heat sink cap having a portion contacting a portion of the substrate covering the compliant, adhesive, and filled with a thermally conductive material, gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the gel elastomer", and "a heat sink cap having a portion thereof in contact with a portion of the substrate and a portion of the compliant, adhesive, and filled with a thermally conductive material, gel elastomer, the heat sink cap covering the compliant, adhesive, and filled with a thermally conductive material, gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate". Neither the Mertol reference nor the Block et al. reference nor any combination thereof teaches or suggests a heat sink cap having a portion thereof contacting a portion of the

substrate. Therefore, presently amended independent claims 1, 4, 6, and 9 are allowable as well as the dependent claims therefrom.

Obviousness Rejection Based on Mertol (U.S. Patent 5,909,056) and Block et al. (U.S. Patent 5,137,959) as applied to claims 1, 4, 6 and 9 and further in combination with Chia et al. (U.S. Patent 6,225,695)

Claims 2, 5, 7 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mertol (U.S. Patent 5,909,056) and Block et al. (U.S. Patent 5,137,959) as applied to claims 1, 4, 6 and 9 and further in combination with Chia et al. (U.S. Patent 6,225,695). Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicant has amended the claimed invention to clearly distinguish over the cited prior art.

Applicant asserts that dependent claims 2, 5, 7 and 10 are allowable as being dependent from an allowable independent claim, such as presently amended independent claims 1, 4, 6, and 9.

Double Patenting Rejection Based on U.S. Patent 6,229,204

Claims 1 through 10 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8 and 9 of U.S. Patent 6,229,204 in view of U.S. Patent 6,225,695 to Chia et al. In order to avoid further expenses and time delay, Applicant elects to expedite the prosecution of the present application by filing a terminal disclaimer to

obviate the double patenting rejections in compliance with 37 CFR §1.321 (b) and (c). Applicant's filing of the terminal disclaimer should not be construed as acquiescence in the Examiner's double patenting or obviousness-type double patenting rejections. Attached are the terminal disclaimer and accompanying fee.

Applicant asserts that claims 1 through 10 are clearly allowable over the cited prior art. Applicants request the allowance of claims 1 through 10 and the case passed for issue.

Respectfully submitted,

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